3. Synthesisers

Objectives

- Identify **synthesiser modules** and their **functions**
- Discuss **types of synthesis**
- Consider the f**unctions of other parts** on a **simple analogue synthesiser**

Skills Development

- Logical Thinking

Key Words

VCO / VCF / VCA
Resonance
Cut off frequency
Envelope
LFO
Analogue/Digital
FM Synthesis
Trigger
Polyphonic
Monophonic
Legato
Glide
Pitch Bend
Modulation

3. Synthesisers

- A synthesiser is an **electronic sound generator** capable of **creating & manipulating synthetic sounds.**
- **Analogue** synthesis uses an **electrical voltage** to generate a signal which is then **shaped.**
- **Digital** synthesis can use computer technology to **model other synthesisers** & generate sounds. **FM synthesis** (frequency modulation) is a type of digital synthesis.

3. Synthesisers

Early MiniMoog Synthesiser

Subtractive and Additive Synthesis

- **Subtractive** synthesisers start with a harmonically rich waveform & use filters to remove frequencies.

- **Additive** synthesisers layer up simple waveforms (e.g. sine waves) to produce a more complex wave.

Polyphony

- A synthesiser's **polyphony** tells us how many notes it **can play simultaneously.**

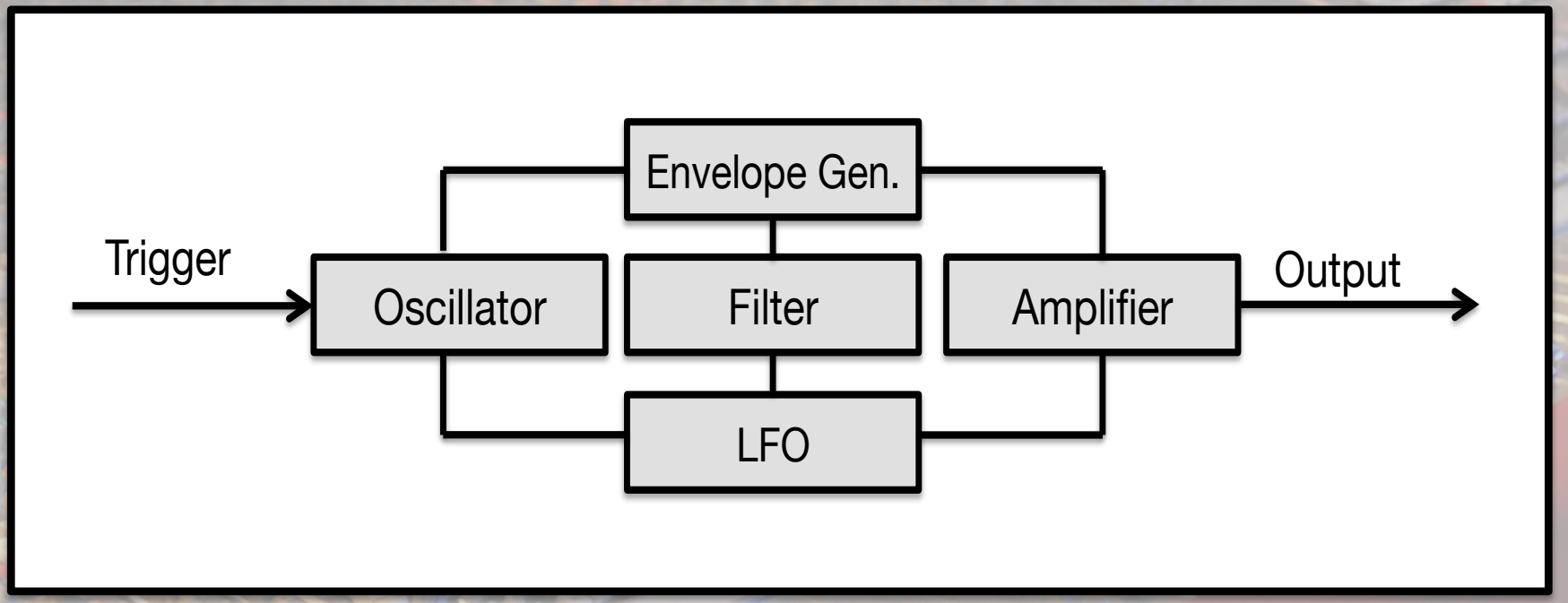
- A **monophonic** synthesiser can **only play one note at once.**

Jupiter
Prophet 5
Synthesiser

Glide and Portamento

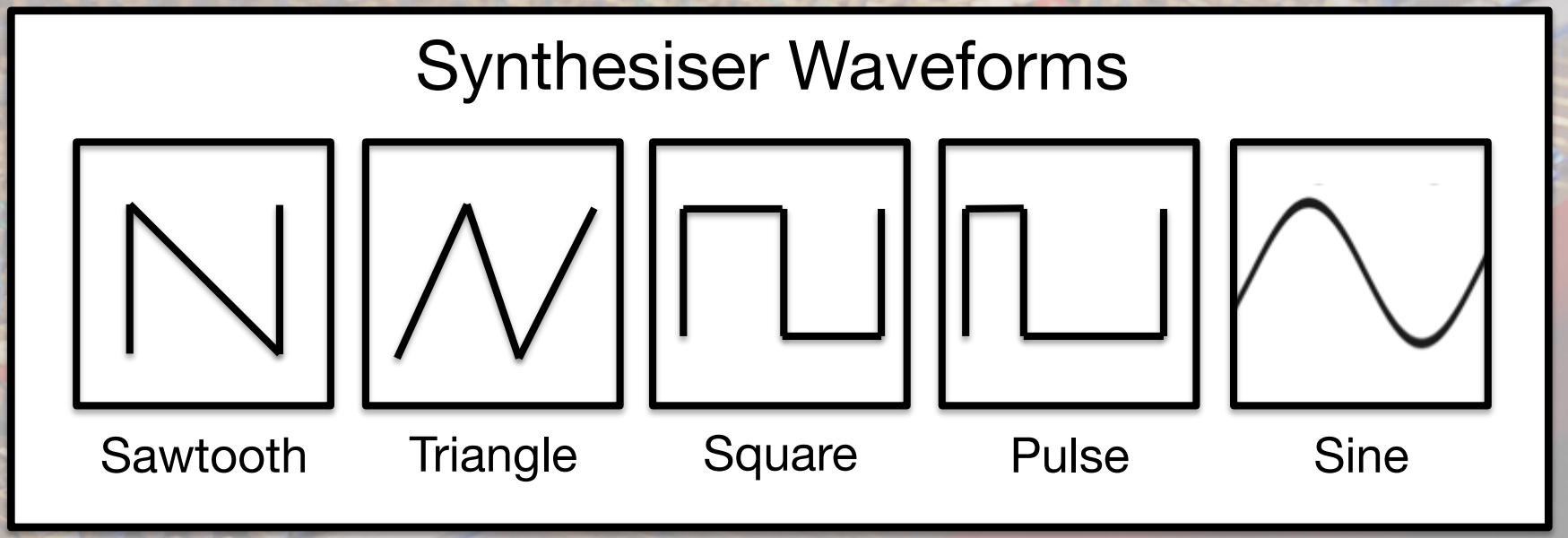
- Glide or portamento allows a synth (often monophonic) to slide between two notes.
- The MiniMoog was one of the first synthesisers to feature a pitch wheel

Synthesiser Modules



Synthesiser Modules

- The **oscillator** generates an initial sound & allows you to select a **waveform**.



Synthesiser Modules

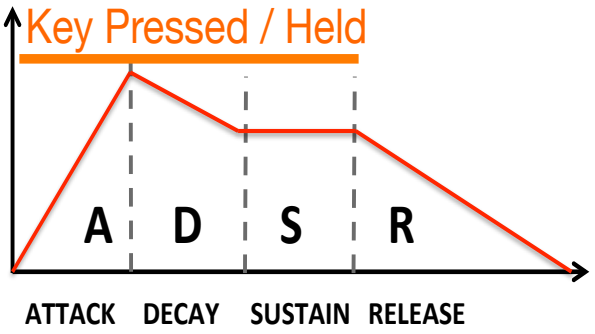
- The filter **removes frequencies** to shape the sound.
- Synths **often incorporate a low pass filter**, which removes all of the frequencies **above the cut off frequency.**
- The amplifier **controls the sound's volume.**

Synthesiser Modules

- The **envelope generator** changes the **attack, decay, sustain & release** of the sound and can be applied to the **oscillator, filter or/and amplifier** in lots of synthesisers

ATTACK
Time taken for sound to increase from 0 to decay phase.

DECAY
Time taken for sound to fall to sustain level

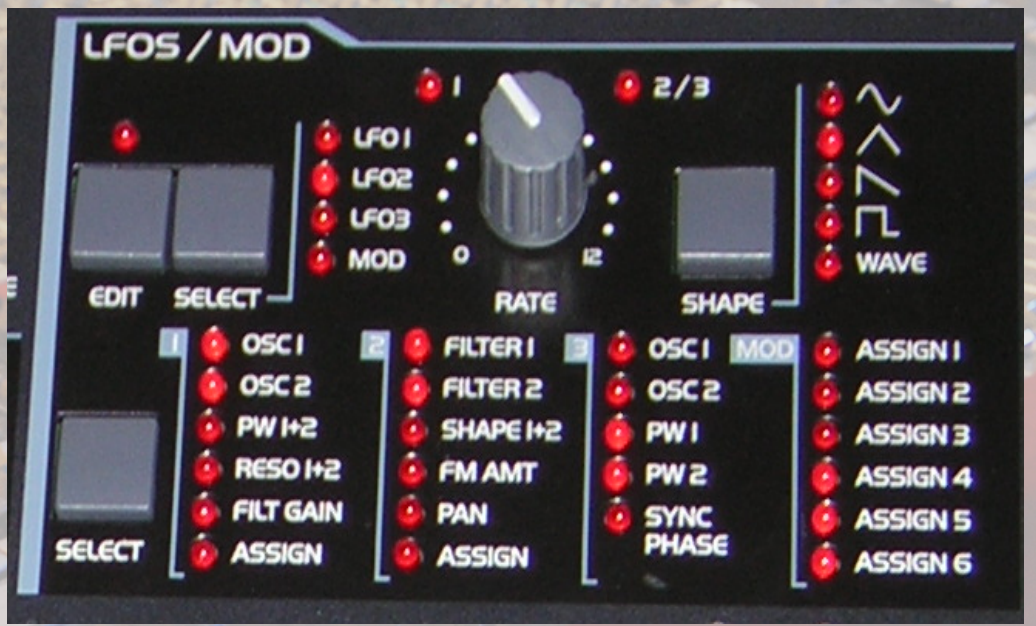


SUSTAIN
Level at which the note holds whilst key remains pressed

RELEASE
Time taken once key released for note to fall to 0

Synthesiser Modules

- The **LFO modulates** a parameter of the sound **over time** and **according to another waveform**



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